IFW 2882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Mark Joachim Mildner et al.	
Filing Date:	June 2, 2006	Examiner: Irakli Kiknadze
Application No.:	10/581,542	
		Group Art Unit: 2882
Title:	"Modular X-ray Tube and Method of Production Thereof"	
		Patents

Amendment

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner For Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on February 11, 2008.

Barbara Urwiller

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Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
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Dear Sir:

Pursuant to the Office Action of November 16, 2007, please amend the above identified patent application as follows:

531. It is also important to point out that the electrodes 20/30/423/433/443 of the acceleration modules 41,...,45 can comprise a ~~shielding 412,...,415~~ shielding 412, 422, 432, 442 and 452 for suppression of the stray electron flow on the ceramic insulator 51 (Figure 6/13). This has the advantage that the shields constitute supplementary protection for the ceramic insulators 51. The service life of the X-ray tubes and/or the difference in potential between the individual acceleration electrodes 20/30/423/433/443 can thereby be further increased. The simple and modular construction of the X-ray tube 10 according to the invention is especially well suited to a manufacturing process with a one-shot method, or respectively this design makes possible in principle the one-shot method in an efficient way. The soldering of the entire tube 10 takes place thereby in a one-step vacuum soldering process. This has the advantage, among others, that the subsequent evacuation of the X-ray tube 10 by means of high vacuum pump can be omitted. A further advantage of the one-shot method, i.e. of the one-step manufacturing process by means of the overall soldering of the tube in the vacuum (one-shot method), is, among others, that one has a single production process, and not three, as in the conventional way: 1. soldering of components / 2. joining of components (e.g. soldering or welding) / 3. evacuation of the tube by means of vacuum pump. The one-step manufacturing method is therefore economically more efficient, time-saving and cheaper. At the same time, with suitable process control, contamination of the tubes can be minimized with this method. Anyhow it can be advantageous when the tube is free of impurities to a large extent which, as a rule, minimize the ceramic insulator's ability to withstand voltage. The requirements with respect to vacuum tightness for the tubes 10 are in most cases the same with one-shot methods as with multi-step manufacturing processes. Since the fields inside the tube 10 are much smaller than in the case of conventional tubes, the tube 10 according to the invention is moreover less vulnerable to impurities and/or leaks. This makes the X-ray tube 10 according to the invention further suitable for the one-shot method. The X-ray tube 10 according to the invention can be excellently used for manufacture of an entire irradiation system and/or for individual irradiation devices 60 (see Figure 12). In such an irradiation device 60, the tube 10 can be stored in a housing 65, e.g. in insulating oil. The shield housing 65 can include an emission hole 61 for X-radiation γ. The irradiation device 60 comprises for

the tube 10 a corresponding high voltage cascade 62, e.g. with an assigned high voltage transformer 63 and voltage connections 64 to the outside. Such irradiation devices 60 or monoblocks 60 can then be used e.g. for manufacture of larger irradiation systems. Of course it is clear to one skilled in the art in the field that the tube 10 according to the invention, without target or transmission anode, is also excellently suited as electron emitter and/or electron cannon with the corresponding industrial areas of application owing to its simple, modular construction and its high performance.